REMARKS

As a preliminary matter, a Supplemental Information Disclosure Statement under 37 CFR 1.97(c) was filed on May 16, 2002. A copy is enclosed with this action for ready reference. Applicants respectfully request an acknowledgement that the Examiner has considered those documents and has made them of record, or alternatively that replacement copies are desired.

Reconsideration of the application is respectfully requested. Claims 27-38 are under consideration. Claim 27 has been amended to correct an inadvertent editorial error. Claim 38 has been amended to address an antecedent basis issue raised by the Examiner. Claim 33 has likewise been amended to remove similar language.

Claim 38 stands rejected under 35 U.S.C. §112, second paragraph, with the argument that the phrase "the underlying ceramic" lacks antecedent basis. Applicants have amended claim 38 to remove the term "underlying." Claim 33 included the same term in a similar context and was therefore likewise amended.

The rejection of claim 27 under 35 U.S.C. 103(a) as unpatentable over the U.S. Patent No. 6,081,174 to Takei et al (the "Takei patent") is respectfully traversed. The Takei patent does not teach or suggest carrying out the ablative etching such that the unmetallized areas are recessed into the block ceramic material. The Office Action implies that the "recessed" feature is somehow shown in Takei patent FIG. 2 (*7 Oct. Office Action, p. 3, lines 9-10*). Applicants' representatives have studied Takei patent FIG. 2 with interest but cannot identify any part of Takei patent FIG. 2 showing a recessed area.

The very limited and cursory discussion of device fabrication present in the Takei patent does not warrant a liberal extension to undisclosed features. Indeed, the single paragraph surrounding the five-line passage (i.e., 7:35-39) of the Takei patent cited in the Office Action is the only portion of the Takei patent discussing dielectric body fabrication.

As noted by the Office Action, the Takei patent is further distinguishable from the presently claimed method because the Takei patent calls for combining multiple single resonator bodies to form a filter.

Claims 28-37 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the Takei patent in view of U.S. Patent No. 6,154,106 to De Lillo (the "De Lillo patent").

Claims 28-37 call for unmetallized areas recessed into the block. As noted above, the Takei patent fails to teach or suggest this feature. The De Lillo patent does not cure this defect.

Applicants respectfully disagree with the Office Action's assertion that De Lillo "teaches the step of heat-treating the patterned block..." (*7 Oct. Office Action, p. 3, last two lines*). The passage of the De Lillo patent cited in the Office Action concerns the processing of a nine-layer multi-material subassembly. At col. 9, lines 40-43, De Lillo teaches using nine layers of R03010 (Rogers Corporation). As the enclosed product specification (Exhibit A) from Rogers Corporation reveals, R03010 material is a ceramic-filled PTFE composite. The PTFE-composite construction is confirmed at col. 5, line 35. The nine-layer plastic-with-ceramic subassembly of the De Lillo patent cannot be described as a ceramic block.

The functional structural elements of the De Lillo multilayer assembly are entirely different and are not combinable with the elements of the Takei filter. It has long been recognized that references are not properly combinable where none of the cited references suggests the desirability of the inventive combination. *See Application of Imperator*, 179 USPQ 730 (CCPA 1973) *cited by the CAFC for the same proposition in the cases of In re Sernaker*, 217 USPQ 1 (1983) and *In re Gordon*, 221 USPQ 1125 (1984). One of ordinary skill could not have found any motivation within the four corners of either of these references for the combination. The multi-material and several-layer constructions of the De Lillo patent relate neither to the present invention nor the Takei patent.

Regarding claims 31, 32, 34 and 36, the Takei patent does not teach or suggest a type of laser for the etching process. Regarding claims 29 and 35, Applicants' representative has studied the De Lillo patent passage cited by the examiner (i.e. 12:5-50) as well as the other text of the De Lillo patent but can find no teaching linking any heat-treatment temperature to insertion-loss performance.

Claim 38 stands rejected under 35 U.S.C. 103(a) as unpatentable over the Takei patent in view of the De Lillo patent and in further view of U.S. Patent No. 5,512,866 to Vangala et al. The Vangala patent is cited in the Office Action to show the transmitter, antenna and receiver pad features. The Vangala patent does not cure any of the

defects of the primary Takei patent reference, however. In particular, the Vangala patent does not refer to ablative etching resulting in recessed areas.

The present amendments to the claims and the accompanying discussion are believed to dispose of all issues in this case and to place this application in condition for allowance. Entry of the amendments, which is of course discretionary, and passing of this application to issue is respectfully requested. Applicants' representative would welcome any opportunity to further discuss options for gaining allowance.

Please charge any deficiency associated with this amendment to our Deposit Account No. 03-1677.

Respectfully Submitted,

Steven Wesemann (Reg. No. 41,372)

CTS Wireless Components
171 Covington Drive
Bloomingdale, Illinois 60108
(630) 924-3790; (630) 295-6603 – Facsimile

CERTIFICATE OF MAILING

I hereby certify that this AMENDMENT AND RESPONSE UNDER RULE 116 is being deposited with the United States Postal Service as Express Mail Label No. EU424773031US on 14 January 2003 in an envelope addressed to BOX AF, Commissioner for Patents, Washington, D.C. 20231.

Joan C. Ramm

Joan C. Ramm

Version With Markings To Show Changes Made

Claim 27 has been amended as follows:

27 (amended). A method of manufacturing an RF ceramic filter comprising the steps of:

forming a block of ceramic material having an outer surface with at least one pair of opposing sides and defining a plurality of through holes extending between the opposing sides;

covering the block with a conductive coating;

heat treating the coated block; and

ablatively etching a selected area of the heat-treated coated block to form a pattern of metallized and unmetallized areas on the block,

wherein the step of ablatively etching is carried out such that the unmetallized areas are recessed into the block of [dielectric] ceramic material.

Claim 33 has been amended as follows:

33 (amended). A method of manufacturing an RF ceramic filter comprising the steps of:

providing a ceramic block having an outer surface with at least one pair of opposing sides and defining a plurality of through holes extending between the opposing sides;

encasing the block with a conductive coating;

heat treating the coated block;

ablatively etching the conductive [metal] coating and a portion of the [underlying] ceramic block from selected areas of the heat-treated coated block to form a pattern of metallized and unmetallized recessed areas on the block; and

heat treating the patterned block.

Claim 38 has been amended as follows:

38 (amended). A method of manufacturing an RF ceramic filter comprising the steps of:

(a) providing a ceramic block having an outer surface with at least one pair of opposing sides and defining a plurality of through holes extending between the opposing sides;

(b) encasing the block with a conductive coating;

(c) heat treating the coated block;

(d) ablatively etching with a laser the conductive metal coating and a portion of the [underlying] ceramic block from selected areas of the heat-treated coated block to form a pattern of metallized and unmetallized recessed areas on the block,

wherein the pattern of metallized and unmetallized recessed areas includes a transmitter pad, an antenna pad and a receiver pad;

repeating steps (a) through (d) to make a plurality of patterned blocks and thereafter heat treating the plurality of patterned [block] blocks.

EXHIBIT A

ROGERS CORPORATION

Advanced Circuit Materials

Advanced Circuit Materials Division
100 S. Roosevelt Avenue
Chandler, AZ 85226
Tel: 480-961-1382, Fax: 480-961-4533
www.rogerscorporation.com

Data Sheet
1.3000

RO3000® Series High Frequency Circuit Materials

Features and Benefits:

- Low dielectric loss for high frequency performance (RO3003). Laminate can be used in applications up to 30-40 GHz.
- Excellent mechanical properties versus temperature for reliable stripline and multilayer board constructions.
- Uniform mechanical properties for a range of dielectric constants. Ideal for multilayer board designs with a range of dielectric constants. Suitable for use with epoxy glass multilayer board hybrid designs.
- Stable dielectric constant versus temperature and frequency for RO3003. Ideal for band pass filters, microstrip patch antennas, and voltage controlled oscillators.
- Low in-plane expansion coefficient (matched to copper). Allows for more reliable surface mounted assemblies. Ideal for applications sensitive to temperature change and excellent dimensional stability.
- Volume manufacturing process for economical laminate pricing.

Typical Applications:

- Automotive Collision Avoidance Systems
- Automotive Global Positioning Satellite Antennas
- Cellular and Pager Telecommunications Systems
- Patch Antennas for Wireless Communications
- Direct Broadcast Satellites
- Datalink on Cable Systems
- Remote Meter Readers
- Power Backplanes

RO3000® High Frequency Circuit Materials are ceramic- filled PTFE composites intended for use in commercial microwave and RF applications. This family of products was designed to offer exceptional electrical and mechanical stability at competitive prices.

RO3000® series laminates are PTFE-based circuit materials with mechanical properties that are consistant regardless of the dielectric constant selected. This allows the designer to develop multilayer board designs that use different dielectric constant materials for individual layers, without encountering warpage or reliability problems.

The dielectric constant versus temperature of RO3000 series materials is very stable (Charts 1 and 2). These materials exhibit a coefficient of thermal expansion (CTE) in the X and Y axis of 17 ppm/°C. This expansion coefficient is matched to that of copper, which allows the material to exhibit excellent dimensional stability, with typical etch shrinkage (after etch and bake) of less than 0.5 mils per inch. The Z-axis CTE is 24 ppm/ C, which provides exceptional plated through-hole reliability, even in severe thermal environments.

RO3000® series laminates can be fabricated into printed circuit boards using standard PTFE circuit board processing techniques, with minor modifications as described in the application note "Fabrication Guidelines for RO3000® Series High Frequency Circuit Materials."

Available claddings are ½ , 1 or 2 oz./ft² (17, 35, 70 µm thick) electrodeposited copper foil.

RO3000® laminates are manufactured under an ISO 9002 certified system.

Chart 1: RO3003® Laminate Dielectric Constant vs. Temperature

The data in Chart 1 demonstrates the excellent stability of dielectric constant over temperature for RO3003® laminates, including the elimination of the step change in dielectric constant, which occurs near room temperature with PTFE glass materials.

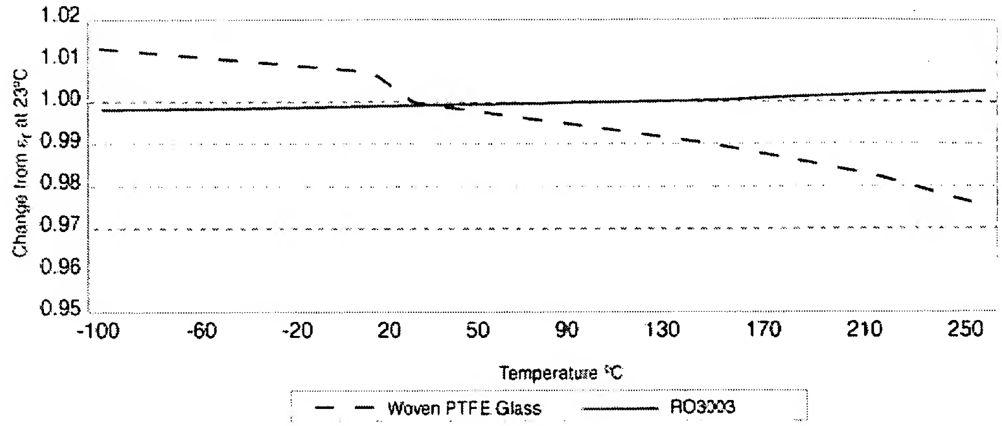


Chart 2: RO3006® and RO3010® Laminate Dielectric Constant vs. Temperature

The data in Chart 2 shows the change in dielectric constant vs. temperature for RO3006® and RO3010® laminates. These materials exhibit significant improvement in temperature stability of dielectric constant when compared to other high dielectric constant PTFE laminates.

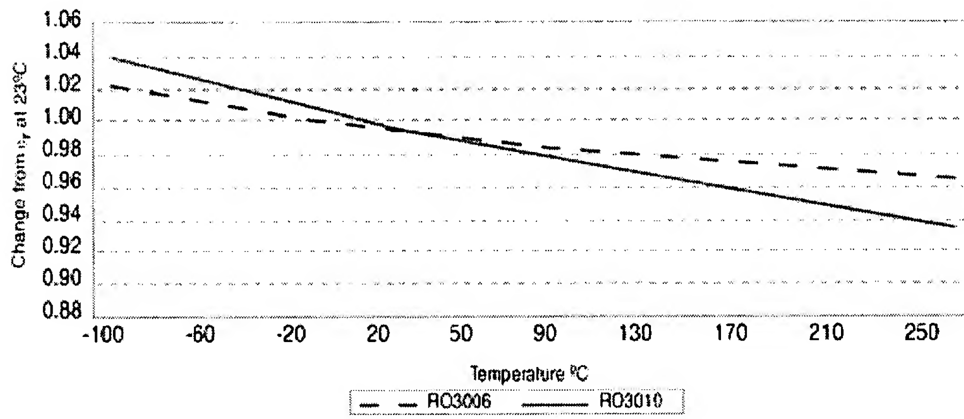
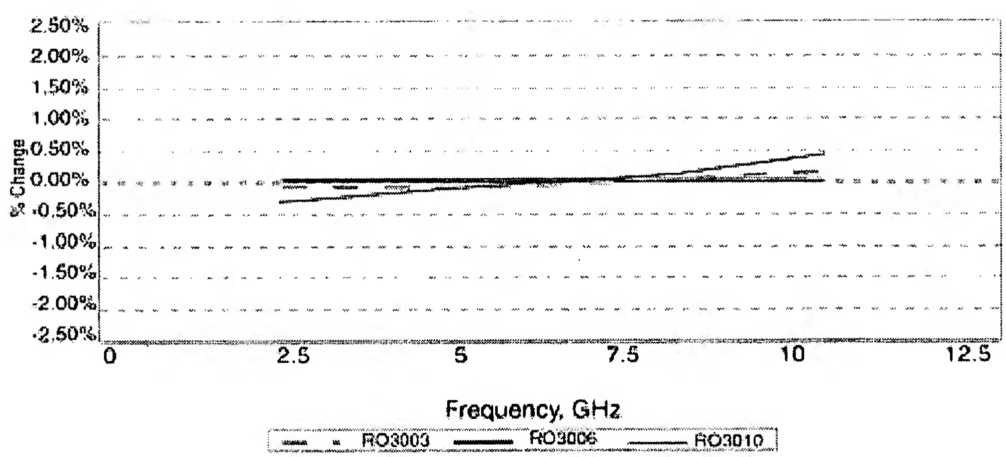


Chart 3: Dielectric Constant vs. Frequency for RO3000® Series Laminate

Chart 3 demonstrates the stability of dielectric constant for RO3000® series products over frequency. This stability simplifies the design of broadband components as well as allowing the materials to be used in a wide range of applications over a very broad range of frequencies.



The data in Charts 1, 2 and 3 was produced using a modified IPC-TM-650, 2.5.5.5 method. For additional information request Rogers T.R. 5156 and T.M. 4924.

PROPERTY	TYPICAL VALUE (1)			DIRECTION	UNIT	CONDITION	TEST METHOD
	RO3003	RO3006	RO3010				
Dielectric Constant ε_r	3.00±0.04(2)	6.15±0.15	10.2±0.30	Z	-	10GHz 23°C	IPC-TM-650 2.5.5.5
Dissipation Factor	0.0013	0.0020	0.0023	Z	-	10GHz 23°C	IPC-TM-650 2.5.5.5
Thermal Coefficient of ε_r	13	-160	-280	Z	ppm/°C	10GHz 0-100°C	IPC-TM-650 2.5.5.5
Dimensional Stability	0.5	0.5	0.5	X,Y	mm/m	COND A	ASTM D257
Volume Resistivity	10^7	10^3	10^3		MΩ•cm	COND A	IPC 2.5.17.1
Surface Resistivity	10^7	10^3	10^3		MΩ	COND A	IPC 2.5.17.1
Tensile Modulus	2068 (300)	2068 (300)	2068 (300)	X,Y	MPa (kpsi)	23°C	ASTM D638
Water Absorption	<0.1	<0.1	<0.1	-	%	D24/23	IPC-TM-650 2.6.2.1
Specific Heat	0.93 (0.22)	0.93 (0.22)	0.93 (0.22)		J/g/K (BTU/lb/°F)		Calculated
Thermal Conductivity	0.50	0.61	0.66	-	W/m/K	100°C	ASTM C518
Coefficient of Thermal Expansion	17 24	17 24	17 24	X,Y Z	ppm/°C	-55 to 288°C	ASTM D3386-94
Color	Tan	Tan	Off White				
Density	2.1	2.6	3.0		gm/cm^3		
Copper Peel Strength	3.1 (17.6)	2.1 (12.2)	2.4 (13.4)		N/mm (lb/in)	After solder float	IPC-TM-2.4.8
Flammability	94V-0	94V-0	94V-0				UL

(1) References: Internal T.R.'s 1430, 2224, 2854. Tests at 23°C unless otherwise noted. Typical values should not be used for specification limits.

(2) The nominal dielectric constant of an 0.060" thick RO3003® laminate as measured by the IPC-TM-650, 2.5.5.5 will be 3.02, due to the elimination of biasing caused by air gaps in the test fixture. For further information refer to Rogers T.R. 5242.

STANDARD THICKNESS:		STANDARD PANEL SIZE:	STANDARD COPPER CLADDING:
RO3003:	**RO3006/3010:**	**RO3003:**	½ oz. (17µm), 1 oz. (35µm), 2 oz. (70µm) electrodeposited copper foil.
0.005" (0.13 mm)	0.005"(0.13 mm)	12" X 18" (305 X 457mm)	
0.010" (0.25 mm)	0.010"(0.25 mm)	24" X 18" (610 X 457mm)	
0.020" (0.50 mm)	0.025"(0.64 mm)	24" X 36" (610 X 915mm)	
0.030" (0.75 mm)	0.050"(1.28 mm)	48" X 36" (1.244m X 915mm)	
0.060" (1.52 mm)		**RO3006/3010:**	
		18" X 12" (457 X 305mm)	
		18" X 24" (457 X 610mm)	
		18" X 36" (457 X 915mm)	
		18" X 48" (457 X 1.224m)	

CONTACT INFORMATION:

USA:	Rogers Advanced Circuit Materials Division, ISO 9002 Certified	Tel: 480-961-1382	Fax: 480-961-4533
Belgium:	Rogers Corporation - Gent	Tel: +32-9-2353611	Fax: +32-9-2353658
Japan:	Rogers Japan Inc.	Tel: 81-3-5200-2700	Fax: 81-3-5200-0571
Taiwan:	Rogers Taiwan Inc.	Tel: 886-2-86609056	Fax: 886-2-86609057
Korea:	Rogers Korea Inc.	Tel: 82-31-716-6112	Fax: 82-31-716-6208
Singapore:	Rogers Technologies Singapore Inc.	Tel: 65-747-3521	Fax: 65-747-7425

The information in this data sheet is intended to assist you in designing with Rogers' circuit material laminates. It is not intended to and does not create any warranties express or implied, including any warranty of merchantability or fitness for a particular application. The user should determine the suitability of Rogers' circuit material laminates for each application.

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